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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,398	09/16/2003	Steven N. Bathiche	003797.00547	1481

28319 7590 05/30/2006

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EXAMINER	
SHERMAN, STEPHEN G	

ART UNIT	PAPER NUMBER
2629	

DATE MAILED: 05/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/662,398	BATHICHE, STEVEN N.	
	Examiner	Art Unit	
	Stephen G. Sherman	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 May 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 11-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 11-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 5-5-06
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment filed the 8 May 2006. Claims 1-8 and 11-18 are pending. Claims 9 and 10 have been cancelled.

Response to Arguments

2. Applicant's arguments with respect to claims 1 and 11 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1, 3 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sellers (US 5,995,026) in view of Kent et al. (US 6,492,979) and further in view of Lamb, Jr. (US 5,276,794).

Regarding claim 1, Sellers discloses a computer keyboard, comprising:

a frame (Figure 2, item 30.);

a plurality of keys located on the frame, each key of the plurality lying on its own movement axis and having pressed and unpressed positions along that movement axis (Figures 1 and 2, items 28 each lay on their own movement axis and have pressed/unpressed positions.);

a plurality of force sensors coupled to the frame and configured such that at least a portion of a force applied by a user to one or more keys of the plurality is transferred to the force sensors, the force sensors generating outputs that vary in relation to the magnitude of the user-applied force (Figure 2, item 44 and column 4, lines 56-61 shows that force sensors 44 are coupled to the frame 30 through item 38 and when one or more keys are pressed, the corresponding force it transferred to the force sensor or sensor corresponding to the key/keys that are pressed, and that the outputs generated by the force sensors vary based on the force F exerted.); and

a microprocessor (Figure 2, item 52) in electrical communication with the force sensor and configured, upon a user pressing multiple keys of the plurality, to

detect simultaneous presses of multiple keys and identify the pressed keys

receive output data from the force sensors resulting from the simultaneous key presses, (Figure 2 and column 5, lines 1-15. The examiner interprets that since each force sensor has its own lead 48 that the microprocessor is able to receive/detect multiple simultaneous key presses.), and

apportion among the multiple pressed keys a total force represented by the force sensor output data resulting from the simultaneous key presses (Figure 2 and column 5, lines 1-15. The examiner interprets that again since each sensor has its own lead 48, that when multiple keys are pressed there is an overall force produced from the presses but since each sensor has its own lead, the force for each key would be correctly output for each key pressed, therefore the total force felt is divided among the keys pressed.).

Sellers fails to teach wherein the plurality of force sensors are not located on any of the movement axes.

Kent et al. disclose of a touch panel which separates the coordinate detection from the force sensors, where the force sensors are not located on the same axes as the coordinate detection means (Figure 7 and column 7, lines 24-52 explain that force sensors 401-404 are used to determine the force applied to the touch screen and that the electrodes 503 are used to determine the touch position coordinates, and as shown in the figure, the two are not located on the same axis.), however, Kent et al. fails to teach of using this sensor configuration for a keyboard.

Lamb, Jr. discloses of a touch panel device which can be used to function as a keyboard (Figure 4A shows the touch screen with a keyboard 60.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the touch panel taught by Kent et al. to display a keyboard as taught by Lamb, Jr. in order to allow for the entry of alphanumeric data into the touch screen system.

Therefore, with the combination of Kent et al. and Lamb, Jr., it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to replace the individual key force sensors taught by Sellers with the four sensors taught by the combination of Kent et al. and Lamb, Jr. such that the force sensors would be separate from the sensors for detecting the touch coordinates, in order to provide a keyboard which can discriminate against false touches.

Regarding claim 3, Sellers, Kent et al. and Lamb, Jr. disclose the computer keyboard of claim 1.

Sellers also discloses wherein the microprocessor is configured to:

individually test each key of the plurality to detect if said key is pressed by a user, and only receive force sensors output data when a key press has been detected (Figure 2 and column 5, lines 1-15. The examiner interprets that allowing no signal to be received at the microprocessor end when the switches are open, i.e. no key has been pressed, is the microprocessor testing the keys individually via the leads 48 and that when a key is pressed and only when a key is pressed is when the microprocessor receives the force signal from the selected key.).

Regarding claim 18, Sellers, Kent et al. and Lamb, Jr. disclose the computer keyboard of claim 1.

Sellers also discloses wherein the microprocessor is configured to, upon a user pressing a single key of the plurality, to

receive corresponding force sensors output data resulting from the single key press (Column 5, lines 1-6 explain that the microprocessor receives output data from the force sensors via leads 48, and one of these force sensors will send data to the microprocessor relating the force on the key.), and

identify the single pressed key using the corresponding force sensors output data (Column 5, lines 1-6. The examiner interprets that since the signal is sent from the key and that the microprocessor 52 can receive the signal from the key that it can also determine what key is pressed, otherwise the keyboard would not function.),

6. Claims 2, 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sellers (US 5,995,026) in view of Kent et al. (US 6,492,979) and further in view of Lamb, Jr. (US 5,276,794) and Houston (US 2002/0154038).

Regarding claim 2, Sellers, Kent et al. and Lamb, Jr. disclose the computer keyboard of claim 1.

Sellers, Kent et al. and Lamb, Jr. fail to teach of a computer keyboard further comprising a grid of conductors located on the frame and forming a plurality of intersections, each intersection including a pair of conductors from the grid, wherein:

each key of the plurality is located over a corresponding intersection and causes an electrical connection between the two conductors of the corresponding intersection when the key is pressed, and the microprocessor is in electrical communication with the conductors.

Houston discloses a computer keyboard (Figure 5, item 100) comprising a grid of conductors located on the frame and forming a plurality of intersections (Figure 5, item 500), each intersection including a pair of conductors from the grid (Figure 5, items C1-Cn and R1-Rn), wherein:

each key of the plurality is located over a corresponding intersection (Figure 5, item 502 and paragraph [0021]. The examiner interprets that since the capacitive element, which is at the intersection of the conductors, is associated with a key that the key is located over the intersection.) and

causes an electrical connection between the two conductors of the corresponding intersection when the key is pressed (Paragraphs [0021]-[0022]. The examiner interprets that since the strobe pulse is sent through the column conductors and when the key is depressed the row conductor is energized by the strobe pulse that this occurs when the key presses the two conductors together causing an electrical connection.), and

a controller in electrical communication with the conductors (Figure 5, item 504. The examiner interprets that the controller is in electrical connection with the conductors since it detects when the keys are pressed.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the conductor method of detecting the key pressing taught by Houston with the computer keyboard taught by Sellers, Kent et al. and Lamb, Jr. such that the pressing of the key would cause the force sensor to sense a force and cause an electrical connection of the conductors in order to provide a keyboard which can be easily reconfigured to accommodate the handicaps of a specific user.

Regarding claim 4, Sellers, Kent et al. and Lamb, Jr. disclose the computer keyboard of claim 1, wherein the force sensor comprises a force-sensitive resistor material (Figure 2, item 44 is an FSR switch.).

Sellers, Kent et al. and Lamb, Jr. fail to teach of a computer keyboard comprising an upper and a lower conductor with a force sensor located between the upper and lower conductors.

Houston discloses of a computer keyboard comprising an upper and a lower conductor with a force sensor located between the upper and lower conductors (Figure 5 and paragraphs [0021]-[0022]. Items R1-Rn and C1-Cn are upper and lower conductors and the capacitive device located at the intersection 502 between the conductors is a force sensor since it detects when a key is pressed and force must be put on a key in order to depress it.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the conductor method of detecting the key pressing taught by Houston with the computer keyboard taught by Sellers, Kent et al. and Lamb,

Jr. such that the pressing of the key would cause the force sensor to sense a force and cause an electrical connection of the conductors in order to provide a keyboard which can be easily reconfigured to accommodate the handicaps of a specific user.

Regarding claim 11, please refer to the rejection of claims 1 and 2. Sellers also discloses a computer keyboard comprising:

a base (Figure 2, item 42);

a plurality of force sensors located between the base and the frame (Figure 2, sensors 44 are located between the frame 30 and the base 42.); and

a microprocessor (Figure 2, item 52):

coupled to the force sensors so as to receive force data output from the force sensors (Figure 2, microprocessor 52 is coupled to the force sensors 44 by leads 48.).

Houston also discloses a computer keyboard having a controller with a plurality of conductor pins each in electrical contact with on of the conductors of the grid (Figure 5 and paragraphs [0022]-[0023]. The examiner interprets that since the controller receives signals form the conductors that the conductors are connected to the controller.).

Kent et al. also disclose of a frame having a plurality of extensions extending therefrom, wherein the force sensors are located between the base and the frame extensions (Figure 7 shows that the force sensors 401-404 are located on extensions provided outside of the screen area 501. The examiner interprets that the sensors then would have to be located between the areas extended outside of screen area 501 and

the base such as the structure shown in Figure 3 in order to detect the force applied to the touch plate.).

7. Claims 5-6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sellers (US 5,995,026) in view of Kent et al. (US 6,492,979) and further in view of Lamb, Jr. (US 5,276,794), Houston (US 2002/0154038) and Muurinen (US 6,504,492).

Regarding claim 5, Sellers, Kent et al., Lamb, Jr. and Houston disclose the computer keyboard of claim 4. Sellers also discloses wherein the microprocessor is configured to:

individually test each key of the plurality to detect if said key is pressed by a user (Figure 2 and column 5, lines 1-15. The examiner interprets that allowing no signal to be received at the microprocessor end when the switches are open, i.e. no key has been pressed, is the microprocessor testing the keys individually via the leads 48.), and

measure an output of the force sensor (Figure 2, X and column 5,lines 1-15).

Sellers, Kent et al., Lamb, Jr. and Houston fail to teach of a computer keyboard wherein a microprocessor is configure to:

permit, upon detecting a pressed key, a voltage to pass to ground through the force sensor, and

measure, subsequent to permitting said voltage to pass to ground through the force sensor, an output of the force sensor.

Muurinen discloses of a computer keyboard which permits, upon detecting a pressed key, a voltage to pass to ground through a resistor, and measures, subsequent to permitting said voltage to pass to ground through the resistor, an output of the resistor (Figure 2 and column 1, line 44 to column 2, line 11. The examiner interprets that when the key is pressed that the current path produced is permitting the voltage from the voltage source to flow to ground, and that since the voltage rail assumes a voltage value caused by the key press and an output signal is generated that this is measuring the output of the resistor after the voltage passes through the resistor and to ground.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the resistance measuring method taught by Muurinen with the computer keyboard taught by the combination of Sellers, Kent et al., Lamb, Jr. and Houston such that the microprocessor would measure the value of the force sensing resistor after the voltage passes through ground in order to allow for less electromagnetic interference and less power dissipation during operation.

Regarding claim 6, Sellers, Kent et al., Lamb, Jr., Houston and Muurinen disclose the computer keyboard of claim 5.

Muurinen also discloses a computer device further comprising an Analog to Digital Converter (ADC) coupled to the resistor and configured to convert a resistor voltage level to a digital value (Column 2, lines 6-11).

Regarding claim 12, this claim is rejected under the same rationale as claim 6.

8. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sellers (US 5,995,026) in view of Kent et al. (US 6,492,979) and further in view of Lamb, Jr. (US 5,276,794).

Regarding claim 7, Sellers, Kent et al. and Lamb, Jr. disclose the computer keyboard of claim 1.

Sellers, Kent et al. and Lamb, Jr. fail to teach wherein the plurality of keys includes multiple character keys having respective characters associated thereto and a plurality of modifier keys.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to include characters on the keys and have modifier keys since it is well know in the art that keyboards have letters and numbers printed on the keys to identify keys from one another and also have modifier keys such as the Shift, Ctrl and Alt keys to modify the existing keys to perform other functions.

Regarding claim 8, Sellers, Kent et al. and Lamb, Jr. disclose the computer keyboard of claim 7.

Sellers, Kent et al. and Lamb, Jr. fail to teach wherein the plurality of keys includes at least 36 character keys.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to include at least 36 character keys since there are 26 letters in the alphabet and 10 number keys are needed, having numbers 0-9, to create any number, thus making the total number of keys needed to be at least 36.

9. Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sellers (US 5,995,026) in view of Kent et al. (US 6,492,979) and further in view of Lamb, Jr. (US 5,276,794), Houston (US 2002/0154038), Muurinen (US 6,504,492) and Olodort et al. (US 6,563,434).

Regarding claim 13, Sellers, Kent et al., Lamb, Jr., Houston and Muurinen disclose the computer keyboard of claim 12.

Sellers, Kent et al., Lamb, Jr., Houston and Muurinen fail to teach of a computer keyboard wherein a microprocessor is configured to:

ground a pin in electrical contact with a first conductor,

test a pin in electrical contact with a second conductor for a voltage level indicative of a press of the key associated with the intersection of the first and second conductors, and

upon detecting the voltage level indicating a press of the associated key, read from the ADC data generated by the press of the associated key.

Olodort et al. disclose of a computer keyboard wherein a microcontroller is configured to:

ground a pin in electrical contact with a first conductor (Figure 40 and column 18, lines 32-51. The examiner interprets that since it is detected which bus is connected to ground that there is a capability for the bus, or pin, to be grounded.),

test a pin in electrical contact with a second conductor for a voltage level indicative of a press of the key (Figure 40 and column 18, lines 32-51. The examiner interprets that determining which bus is connected to ground or to positive current is testing for a key press.), and

upon detecting the voltage level indicating a press of the associated key, read from the ADC data generated by the press of the associated key (Figure 40 and column 18, lines 32-51. The examiner interprets that after scanning the conductors, since the analog to digital converter makes the value available to the microcontroller that this would detect which key is pressed and read the data.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use microcontroller method taught by Olodort et al. with the keyboard taught by the combination of Sellers, Kent et al., Lamb, Jr., Houston and Muurinen in order to allow for the proper identification of a pressed key.

Regarding claim 14, this claim is rejected under the same rationale as claim 4.

Regarding claim 15, this claim is rejected under the same rationale as claim 9.

Regarding claim 16, this claim is rejected under the same rationale as claim 7.

Regarding claim 17, this claim is rejected under the same rationale as claim 8.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SS

25 May 2006

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